Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A processing apparatus comprising:

a vessel which accommodates a target object;

ultraviolet light generating means for outputting ultraviolet light or vacuum ultraviolet light toward an atmosphere containing radicals in said vessel;

ultraviolet light receiving means for receiving the ultraviolet light or vacuum ultraviolet light passing through the atmosphere;

temperature measuring means for measuring a temperature of molecular or atomic radicals in the atmosphere; and

analysis control means for obtaining a density of the radicals in the atmosphere on the basis of at least an output signal from said ultraviolet light receiving means, to control a process parameter by using the density of the radicals, in consideration of a temperature error in the density of the radicals on the basis of the temperature measured by said temperature measuring means.

~~means for intermittently outputting the ultraviolet light or vacuum ultraviolet light toward the atmosphere and outputting an ultraviolet light~~

~~presence/absence signal indicating presence/absence of the ultraviolet light or vacuum ultraviolet light; and~~

~~means operatively configured to obtain a difference calculated by subtracting a light reception amount of said ultraviolet light receiving means obtained when the ultraviolet light or vacuum ultraviolet light is absent from a light reception amount of said ultraviolet light receiving means obtained when the ultraviolet light or vacuum ultraviolet light is present on the basis of the ultraviolet light presence/absence signal, and obtaining the density of the radicals in the atmosphere from the difference.~~

2. (Previously Presented) A processing apparatus according to claim 1, wherein said analysis control means obtains an attenuation amount of the ultraviolet light or vacuum ultraviolet light passing through the atmosphere on the basis of the output signal from said ultraviolet light receiving means, and obtains the density of the radicals in the atmosphere from the attenuation amount.

3. (Canceled)

4. (Previously Presented) A processing apparatus according to claim 1, further comprising means for causing the ultraviolet light or vacuum ultraviolet light output from said ultraviolet light generating means to pass through a

plurality of optical paths in said vessel and to be received by said ultraviolet light receiving means.

5. (Previously Presented) A processing apparatus according to claim 4, comprising modulators arranged to said optical paths respectively and having modulation frequencies that are different from each other.

6. (Previously Presented) A processing apparatus according to claim 1, wherein said vessel has a window through which the ultraviolet light passes, and said window is heated.

7. (Previously Presented) A processing apparatus according to claim 1, wherein said vessel has a window through which the ultraviolet light passes, and said window has a cylindrical structure.

8. (Canceled)

9. (Currently Amended) A processing apparatus according to claim **[[8]]** 1, wherein said temperature control means includes laser beam generating means for generating a laser beam toward the atmosphere,

laser beam receiving means for receiving the laser beam passing through the atmosphere; and

analysis means for obtaining an attenuation amount spectrum of the laser beam passing through the atmosphere on the basis of an output signal from said laser beam receiving means, and obtaining a temperature of molecular or atomic radicals in the atmosphere from a pattern of the attenuation amount spectrum.

10. (Previously Presented) A processing apparatus according to claim 9, further comprising:

means for intermittently outputting the laser beam toward the atmosphere and outputting a laser beam presence/absence signal indicating presence/absence of the laser beam; and

means for obtaining a spectrum of a difference calculated by subtracting a light reception amount of said laser beam receiving means obtained when the laser ultraviolet beam is absent from a light reception amount of said laser beam receiving means obtained when the laser beam is present on the basis of the laser beam presence/absence signal, and obtaining a temperature of the molecular or atomic radicals in the atmosphere from a pattern of the spectrum.

11. (Currently Amended) A processing apparatus according to claim **[[8]]** 1, wherein said temperature measuring means measures a light emission spectrum of the molecular or atomic radicals in the atmosphere, and obtains a temperature of the molecular or atomic radicals in the atmosphere from an obtained spectrum pattern.

12. (Previously Presented) A processing apparatus according to claim 9, further comprising means for causing the laser beam output from said laser beam generating means to pass through a plurality of optical paths in said vessel, and to be received by said laser beam means.

13. (Previously Presented) A processing apparatus according to claim 12, further comprising modulators arranged to said optical paths respectively and having modulation frequencies that are different from each other.

14. (Previously Presented) A processing apparatus according to claim 9, wherein said vessel has a window through which the laser beam passes, and said window is heated.

15. (Previously Presented) A processing apparatus according to claim 9, wherein said vessel has a window through which the laser beam passes, and said window has a cylindrical structure.

16. (Previously Presented) A processing apparatus according to claim 1, wherein the radicals are atomic radicals.

17. (Previously Presented) A processing apparatus according to claim 16, wherein the atomic radicals include any one element selected from Si, N, O, F, H, and C.

18. (New) A processing apparatus according to claim 1, further comprising:

means for intermittently outputting the ultraviolet light or vacuum ultraviolet light toward the atmosphere and outputting an ultraviolet light presence/absence signal indicating presence/absence of the ultraviolet light or vacuum ultraviolet light; and

means operatively configured to obtain a difference calculated by subtracting a light reception amount of said ultraviolet light receiving means obtained when the ultraviolet light or vacuum ultraviolet light is absent from a light reception amount of said ultraviolet light receiving means obtained when the ultraviolet light or vacuum ultraviolet light is present on the basis of the ultraviolet light presence/absence signal, and obtaining the density of the radicals in the atmosphere from the difference.

19. (New) A processing apparatus comprising:

a vessel which accommodates a target object;

ultraviolet light generating means for outputting ultraviolet light or vacuum ultraviolet light toward an atmosphere containing radicals in said vessel;

ultraviolet light receiving means for receiving the ultraviolet light or vacuum ultraviolet light passing through the atmosphere;

temperature measuring means for measuring a temperature of molecular or atomic radicals in the atmosphere; and

analysis control means for obtaining a density of the radicals in the atmosphere on the basis of an output signal from said ultraviolet light receiving means, correcting the density of the radicals on the basis of a measurement result of said temperature measuring means, to control a process parameter by using the corrected density of the radicals.